

Amendment to Claims

The following listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A process for the removal of H₂S and mercaptans from a gaseous hydrocarbon gas stream comprising these compounds, which process comprises the steps of:
 - (a) removing H₂S from the gaseous hydrocarbon gas stream by contacting the gaseous hydrocarbon gas stream in a H₂S-removal zone with a first aqueous alkaline washing liquid buffered at a pH between 4.5 and 10, at a temperature between 5 and 70°C and a pressure between 1 and 100 bar, to obtain a H₂S-depleted gas stream and a sulphide-comprising aqueous stream;
 - (b) removing mercaptans from the H₂S-depleted gas stream obtained in step (a) by contacting the H₂S-depleted gas stream in a mercaptan-removal zone with a second aqueous alkaline washing liquid buffered at a pH between 5.5 and 10, at a temperature between 5 and 70°C and a pressure between 1 and 100 bar, to obtain a mercaptan-depleted gas stream and an thiolate-comprising aqueous stream, said mercaptan-depleted gas stream having a level of H₂S below 10 ppmv and a level of mercaptans below 6 ppmv;
 - (c) contacting the combined aqueous streams comprising sulphide and thiolates obtained in step (a) and step (b) with sulphide-oxidizing bacteria in the presence of oxygen in an oxidation reactor to obtain a sulphur slurry and a regenerated aqueous alkaline washing liquid;
 - (d) separating at least part of the sulphur slurry obtained in step (c) from the regenerated aqueous alkaline washing liquid; and
 - (e) recycling the regenerated aqueous alkaline washing liquid from the oxidation reactor to the H₂S-removal zone in step (a) and to the mercaptan-removal zone in step (b).

2. (Currently amended) A process according to claim 1, wherein the ~~regenerated alkaline washing liquid is recycled from the oxidation reactor to the H₂S-removal zone in step (a) and to the mercaptan-removal zone in step (b)~~ pH of the aqueous alkaline washing liquid in the mercaptan removal zone is higher than the pH of the aqueous washing liquid in the H₂S removal zone.

3. (Currently Amended) A process according to claim 2, wherein the aqueous alkaline washing liquid in step (a) is buffered at a pH between 5.5 and 9.
4. (Currently Amended) A process according to claim 3, wherein the aqueous alkaline washing liquid in step (b) is buffered at a pH between 7.5 and 9.
5. (Currently Amended) A process according to claim 4, wherein the contents of the oxidation reactor in step (c) is buffered at a pH between 8 and 10.
6. (Currently Amended) A process according to 5, wherein the H₂S concentration of the gas stream entering the H₂S-removal zone in step (a) is between 150 ~~[[50]]~~ ppmv and 50 ~~[[90]]~~ vol%.
7. (Currently Amended) A process according to claim 6, wherein the H₂S concentration of the ~~mercaptan~~ H₂S-depleted gas stream is between 0.02 and 3.5 ppmv ~~less than 10 ppmv, especially between 0.01 and 10 ppmv, based on the total mercaptan-depleted gas stream.~~
8. (Currently Amended) A process according to claim 7, wherein the concentration of mercaptan compounds in the mercaptan-depleted gas stream is less than 4 ~~[[6]]~~ ppmv, based on the total mercaptan-depleted gas stream.
9. (Currently Amended) A gas-treating unit for the removal of H₂S and mercaptans from a gaseous hydrocarbon gas stream comprising these compounds, the gas treating unit comprising at least two gas scrubbers for contacting the gaseous hydrocarbon stream with an aqueous alkaline washing liquid, said gas scrubbers having ~~with~~ inlets and outlets, at least one oxidation reactor with inlets and outlets and a solid/liquid separator with an inlet and outlets, the first gas scrubber having a discharge line for gas debouching into the inlet of the second gas scrubber, the first and the second gas scrubbers both having a discharge line for liquid debouching into the oxidation reactor, the oxidation reactor having an outlet debouching into the inlet of the solid/liquid separator, an outlet for liquid debouching into the inlets of the first gas scrubber and the second gas scrubber.
10. (Previously presented) A gas treating unit according to claim 9, wherein the first and the second gas scrubber are placed on top of each other in one vessel.

11. (New) A process according to claim 1, wherein the concentration of total sulphur compounds in the mercaptan-depleted gas stream is between 0.05 and 3.5 ppmv and the concentration of mercaptan compounds in the mercaptan-depleted gas stream is less than 2 ppmv, based on the total mercaptan-depleted gas stream.